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International application number: PCT/US05/025658

International filing date: 19 July 2005 (19.07.2005)

Document type: Certified copy of priority document

Document details: Country/Office: US  
Number: 10/959,530  
Filing date: 05 October 2004 (05.10.2004)

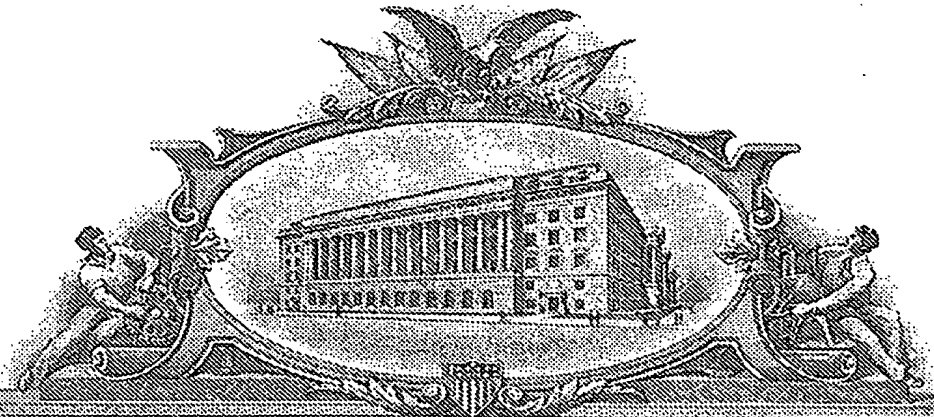
Date of receipt at the International Bureau: 12 September 2005 (12.09.2005)

Remark: Priority document submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b)



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**APPLICATION NUMBER: 10/959,530**

**FILING DATE: October 05, 2004**

**RELATED PCT APPLICATION NUMBER: PCT/US05/25658**



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**UTILITY PATENT APPLICATION TRANSMITTAL**  
**(Small Entity)**

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.  
COBR-10493

Total Pages in this Submission

**COMMISSIONER FOR PATENTS**

P.O. Box 1450  
Alexandria, VA 22313-1450

Transmitted herewith for filing under 35 U.S.C. 111(a) and 37 C.F.R. 1.53(b) is a new utility patent application for an invention entitled:

**CONCERTINA TAPE PRODUCTS CONFIGURED FOR STABLE DEPLOYMENT AND RETRIEVAL**

and invented by:

**Michael V. Pavlov**

If a **CONTINUATION APPLICATION**, check appropriate box and supply the requisite information:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: \_\_\_\_\_

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Enclosed are:

**Application Elements**

1. ☒ Filing fee as calculated and transmitted as described below
2. ☒ Specification having 25 pages and including the following:
  - a. ☒ Descriptive Title of the Invention
  - b. ☐ Cross References to Related Applications (if applicable)
  - c. ☐ Statement Regarding Federally-sponsored Research/Development (if applicable)
  - d. ☐ Reference to Sequence Listing, a Table, or a Computer Program Listing Appendix
  - e. ☒ Background of the Invention
  - f. ☒ Brief Summary of the Invention
  - g. ☒ Brief Description of the Drawings (if filed)
  - h. ☒ Detailed Description
  - i. ☒ Claim(s) as Classified Below
  - j. ☒ Abstract of the Disclosure

**UTILITY PATENT APPLICATION TRANSMITTAL**  
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Docket No.  
COBR-10493

Total Pages in this Submission

**Application Elements (Continued)**

3. ☒ Drawing(s) *(when necessary as prescribed by 35 USC 113)*
- a. ☐ Formal      Number of Sheets \_\_\_\_\_
- b. ☒ Informal      Number of Sheets      8
4. ☒ Oath or Declaration
- a. ☐ Newly executed *(original or copy)*      ☒ Unexecuted
- b. ☐ Copy from a prior application (37 CFR 1.63(d)) *(for continuation/divisional application only)*
- c. ☒ With Power of Attorney      ☐ Without Power of Attorney
- d. ☐ DELETION OF INVENTOR(S)  
Signed statement attached deleting inventor(s) named in the prior application,  
see 37 C.F.R. 1.63(d)(2) and 1.33(b).
5. ☐ Incorporation By Reference *(usable if Box 4b is checked)*  
The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.
6. ☐ CD ROM or CD-R in duplicate, large table or Computer Program (Appendix)
7. ☐ Application Data Sheet (See 37 CFR 1.76)
8. ☐ Nucleotide and/or Amino Acid Sequence Submission *(if applicable, all must be included)*
- a. ☐ Computer Readable Form (CFR)
- b. ☐ Specification Sequence Listing on:
- i. ☐ CD-ROM or CD-R (2 copies); or
- ii. ☐ Paper
- c. ☐ Statement(s) Verifying Identical Paper and Computer Readable Copy

**Accompanying Application Parts**

9. ☐ Assignment Papers (cover sheet & document(s))
10. ☐ 37 CFR 3.73(B) Statement (when there is an assignee)
11. ☐ English Translation Document (if applicable)
12. ☐ Information Disclosure Statement/PTO-1449      ☐ Copies of IDS Citations
13. ☐ Preliminary Amendment
14. ☒ Return Receipt Postcard (MPEP 503) (Should be specifically itemized)
15. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed)
16. ☒ Certificate of Mailing
- ☐ First Class      ☒ Express Mail (Specify Label No.): EV529650173US

**UTILITY PATENT APPLICATION TRANSMITTAL  
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**Accompanying Application Parts (Continued)**

17. ☒ Applicant claims small entity status. See 37 CFR 1.27.

☐ (Optional) Small Entity Statement(s) - Specify Number of Statements Submitted: \_\_\_\_\_

18. ☐ Additional Enclosures *(please identify below)*:

**Request That Application Not Be Published Pursuant To 35 U.S.C. 122(b)(2)**

19. ☐ Pursuant to 35 U.S.C. 122(b)(2), Applicant hereby requests that this patent application not be published pursuant to 35 U.S.C. 122(b)(1). Applicant hereby certifies that the invention disclosed in this application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication of applications 18 months after filing of the application.

**Warning**

***An applicant who makes a request not to publish, but who subsequently files in a foreign country or under a multilateral international agreement specified in 35 U.S.C. 122(b)(2)(B)(i), must notify the Director of such filing not later than 45 days after the date of the filing of such foreign or international application. A failure of the applicant to provide such notice within the prescribed period shall result in the application being regarded as abandoned, unless it is shown to the satisfaction of the Director that the delay in submitting the notice was unintentional.***

11/21 U.S. PTO

**UTILITY PATENT APPLICATION TRANSMITTAL  
(Small Entity)***(Only for new nonprovisional applications under 37 CFR 1.53(b))*Docket No.  
COBR-10493

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**Fee Calculation and Transmittal****CLAIMS AS FILED**

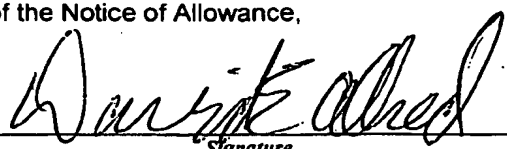
For	#Filed	#Allowed	#Extra	Rate	Fee
Total Claims	36	- 20 =	16	x \$9.00	\$144.00
Indep. Claims	4	- 3 =	1	x \$43.00	\$43.00
Multiple Dependent Claims (check if applicable) <input type="checkbox"/>					\$0.00
BASIC FEE					\$385.00
OTHER FEE (specify purpose) _____					\$0.00
TOTAL FILING FEE					\$572.00

- ☒ A check in the amount of \$572.00 to cover the filing fee is enclosed.
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Dated: October 6, 2004

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CERTIFICATE OF MAILING BY "EXPRESS MAIL" (37 CFR 1.10)

Applicants: Pavlov

Docket No.: COBR-10493

Serial No.:

Filing Date:

Examiner:

Group Art Unit:

Title: Concertina Tape Products Configured for Stable Deployment and Retrieval

I hereby certify that the following:

1. Transmittal form;
2. Unexecuted Declaration and Power of Attorney;
3. Postcard;
4. 25 pages of Specification with 8 sheets of drawings; and
5. Prescribed Filing Fee of \$ 583.00.

are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 in an envelope addressed to: Commissioner for Patents, Mail Stop Application, P.O. Box 1450, Alexandria, VA 22313-1450 on  
October 5, 2004.

Gina Thomas

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EV529650173US

("Express Mail" Mailing Label Number)

## **CONCERTINA TAPE PRODUCTS CONFIGURED FOR STABLE DEPLOYMENT AND RETRIEVAL**

This application claims the benefit of U.S. Provisional Patent Application serial No. 60/589,668, entitled RAPID DEPLOYMENT BARBED TAPE AND DISPENSER, by the  
5 same inventor, filed July 19, 2004, the disclosure of which is incorporated herein by reference.

### **BACKGROUND OF THE INVENTION**

#### **1. Technical Field**

This invention generally relates to a

#### **2. State of the Art**

10

### **DISCLOSURE OF THE INVENTION**

The present invention relates to a tape product having a concertina coil and at least one of an internal truss and external truss connected to the coil at a plurality of connection points. The truss may advantageously strengthen and/or stabilize the coil.

A plural coil tape products may include a first concertina coil extending from a first end to a second end of the coil along a first coil axis and at least a second concertina coil extending generally from a first end to a second end of the coil along a second coil axis. The second



concertina coil may intersect the first concertina coil in at least partially overlapping side by side relation in a first intersection along the first and second coil axes. The first intersection may comprise a connection of the second concertina coil at more than one circumferentially spaced connection points on the first coil. The product may likewise include intersecting connections to additional coils.

The invention also encompasses a shaped concertina tape product having a concertina coil forming an envelope of a predetermined configuration. The product may include a plurality of trusses connected to the coil. The coil may be thus rigidified against forces in one or more direction so that in a deployed state, an original dimension of the envelope in a rigidified direction is maintained while a dimension in a non-rigidified direction is reduced.

5 A deployment system for deploying and retrieving a concertina tape product may include a product magazine having at least one base, a stanchion supported on the base, and a latch mounted on the stanchion. The stanchion may have an upright member extending upwardly from a first end of the base and a cantilever support member with a first end connected to the upright member and a second end extending in overlying relation to the base toward a second end of the base. The cantilever support member may have a connection structure at the second end of the cantilever support member for selectively receiving a gooseneck member. The gooseneck member may be removeably connected at a first end of the gooseneck member to the connection structure in one of at least two configurations.

10 The foregoing and other features and advantages of the present invention will be apparent from the following more detailed description of the particular embodiments of the invention, as illustrated in the accompanying drawings.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1A is a perspective view of the product and magazine on the transport vehicle according to an embodiment of the present invention;

5      FIG. 1B is another perspective view of the product and magazine on the transport vehicle according to an embodiment of the present invention;

FIGS. 2A-2B are a perspective views of the magazine according to an embodiment of the present invention;

FIG. 3A is an end view of the the product and magazine on the transport vehicle according to an embodiment of the present invention;

10      FIG. 3B is a perspective view of a connection of an upright to a strand of product;

FIGS. 3C is a diagrammatic view of uprights of the embodiment of Figure 3A;

FIG. 3D is a diagrammatic view depicting the relation between counter-rotating and precessing;

FIG. 4 is a side view of the product being deployed;

15      FIGS. 5A-5H, 6A-6P, and 7A-7G are diagrammatic end views of product in various configurations;

FIGS. 8A-8B are a diagram and table showing the narrowing of the width as it relates to the stretch of the product during deployment;

FIG. 9 is a perspective view of a deployed product; and

FIG. 8 is an a perspective view of an alternative magazine  
in accordance with the present invention.

## DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

As discussed above, embodiments of the present invention relate to concertina tape products and systems for stable deployment and retrieval of the products. A deployment system 10 with a concertina tape product 12 is shown in Figure 1A. As shown in Figures 1A and 1B, a trailer 15 may be a modified form of an Amaz-N-Tow™ trailer. A magazine 18 for holding the product may be supported on forks 20 of the trailer 15. Thus, the magazine 18 and the product may be raised and lowered as desired by a hydraulic ram before, during, and after deployment and/or retrieval of the product 12. As shown, the trailer 15 may be pulled by a tow vehicle such as pickup truck 24.

Figure 2A show the magazine 18 in an unloaded state. The magazine may have a base 27 with two receivers 30, 33 for receiving the forks 20 of the trailer 15. The base 27 may also include a support channel 36 supported on cross bars 39, 42 that extend between the receivers 30, 33. An upright member 45 may be mounted at a first end of the base 27 and may be height adjustable by selectively inserting one of a variety of different height shims 47, 48, 49. A cantilever support member 51 may have a first end mounted on the upright member 45 and extend in overlying relation to the base toward a second end thereof. A gooseneck member 54 may be removeably mounted to the second end of the cantilever support member 51 by first and second pins 55, 56 for selective positioning in one of two configurations. The first configuration is shown in solid lines in Figure 2A and is a configuration for deployment of the product. The second configuration is shown in dashed lines and is a securing configuration for holding the product on the magazine against inadvertent falling off. A third configuration with the gooseneck member 54 completely removed may be used for retrieving the product and placement thereof on the magazine 18.

As shown in Figures 1B, 2A, and 2B, The magazine 18 may have a latch 57 that releaseably connects the magazine 18 to the trailer 15. In this regard, the modification of the

Amaz-N-Tow trailer may include tow vehicle upright member 60, upright braces 63, and lateral supports 66, which may be adjustable in a width direction to accommodate coils or rolls of material of different widths. As shown in Figure 1B, the trailer 15 has been modified to support the magazine 18 at a point near in height to an upper portion of the product 12. This  
5 advantageously adds great strength to the magazine and secures it and the product 12 against fore and aft movement as well as side to side movement. The latch 57 may also attach the magazine 18 to the tow vehicle upright 60 near a height of the cantilever support member 51. This configuration transfers loads from the product 12 and the magazine 18 to the tow vehicle upright member 60 and to the trailer 15 when the magazine is held on the trailer 15 by the latch  
10 57 so that an extremely high moment will not be experienced at the connection point of the upright member 45 to the base 27. A pin 67 may be removed from a latch socket to release the latch 57 from a supported condition on the upright member 45 of the magazine 18. Thus, when the latch socket cannot be moved any higher on the upright member 45, such as with the eighty by 64 inch product, the latch may be removed and replaced once the magazine is in an  
15 abutting position against the tow vehicle upright member 60.

Additionally, the height of the cantilever support member 51 is approximately seventy-nine inches so that most of the weight of the product engages the channel member 36 via upright members and the product 12 itself. Thus, the force on the cantilever support and the upright member 45 is reduced.

20 As shown in Figure 1A and the end view of Figure 3, the gooseneck member 54 is in the securing configuration. The gooseneck member 54 in this configuration has been removed from the cantilever member 51. A second end of the gooseneck member 54 may be inserted in a keyed through opening 68 in the support channel 36, and rotated by 180 degrees. Then the first end of the gooseneck member 54 may be mounted by a second bolt 56 in the position  
25 shown in Figures 2A (dashed lines), 1A, and 3. This through opening 68 may be keyed to a protrusion 69 on the gooseneck member 54 that may be inserted through the opening 68 and

rotated to inhibit inadvertent falling out of the second end of the gooseneck member 54 from the support channel 36.

As may be appreciated, the product 12 shown in Figures 1A, 1B, and 3 is a particular kind of product that includes upright trusses 72. While other products may be supported on the magazine 18, deployed therefrom, and retrieved thereon, the particulars of the product shown in Figures 1A, 1B, and 3 are also of importance because they may represent one of the largest diameter products that may be supported and transported on a particular military pallet that is in standard use today. The pallet is the L-463. Furthermore, the product shown may be provided in heights that are taller than the average man. For example, by starting with a coil diameter of approximately seventy-four inches, the vertical height may be extended to eighty inches by using an internal upright truss 72 of eighty-two inches that has a one inch deep notch in each end. A strand of the product may be disposed in each of the notches forcing the product into an oblong configuration that draws the sides inwardly to approximately sixty-four inches. This is advantageous because the product must also be kept within the width limits of the trailer 15. That is, the trailer has a sixty-six inch clearance between the wheel wells in which the product must fit. For the product shown in Figures 1A, 1B, and 3 at a height of eighty inches, the width will be sixty-four inches, which has only a small clearance relative to the wheel wells.

Other size requirements relate to fitting the product on the L-463 pallet and include length, height, and width requirements. The length must be no greater than one hundred and three inches, the height must not be greater than ninety-six inches, and the width must be no greater than eighty-eight inches. The product shown and described with regard to Figures 1A, 1B and 3 has been substantially maximized to provide a large product that will still meet these requirements. Products of greater or smaller sizes may be provided without departing from the spirit and scop of the invention. However, within these maximum dimensions, the product and

the magazine may be supported on the L-463 pallet, airlifted, and dropped to a position of deployment. The modified trailer 15 can also be palletized and dropped to the same position.

As shown in Figure 3A, the receivers may be formed of four inch by ten inch rectangular tubing material. These receivers 30, 33 may be spaced from each other to have lateral centers as shown by a dimension 78 that are approximately twenty-six inches apart to mirror centers of the forks 20 on the Amaz-N-Tow. The forks on the Amaz-N-tow are six inches wide and two inches thick. Thus, the forks have a maximum spread of approximately thirty-two inches and a space therebetween of approximately twenty inches. With the receivers 30, 33 each centered twenty-six inches from each other, a tolerance of two inches on each side of each fork 20 and the receivers will be provided. A range of minimum to maximum spread for the openings of the receivers 30, 33 may thus be from approximately sixteen inches to approximately thirty-six inches. On the other hand, the magazine may be provided with receivers that are spaced in a range of approximately twelve to twenty inches apart at the narrowest part of the openings indicated by a dimension 81. Similarly, the widest part of the openings indicated by the dimension 84 may be in a range from approximately thirty-two inches to approximately forty inches, as shown in Figure 3A. The openings could be made larger if so desired for even greater clearance.

The upright trusses 72 may be fixed to strands 87 of the product 12 at upper and lower portions of the coil by placement of the strands 87 in a notch 90 and crimping of the notch closed on the strands 87 as shown in Figure 3B. This crimping has the advantages of keeping the strands from inadvertently coming out of the notch, and also prevents shifting of the upright trusses 72 along the strand. As shown in Figure 3A and in the analogous diagrammatic view of Figure 3C, the upright trusses are oriented in a range from approximately vertical to approximately thirty degrees to the left of vertical. This orientation of the upright trusses 72 is to accommodate precession that will occur during deployment.

When deploying the product, the payout process is accompanied by rotation forces caused by the torsion that is caused as the product is expanded axially and the product moves radially from its largest diameter to a smaller diameter. These rotational forces if unresisted would cause precession of normally axially aligned clips. For example a 60 inch diameter unit with 9 clips would precess one hour (30 degrees). Longer units will precess further. For example, a five hundred foot unit would have a rotation of twelve hours (360 degrees) when deployed. In order for the upright trusses to be generally perpendicular to the ground and any external trusses to lie in a relaxed state when the product is deployed, the truss attachments need to be placed in a counter rotated configuration. This counter rotated form would cause the trusses 72 to extend radially outward from the coil along substantially the entire circumference of a coil and would cause the coil with its trusses to be non-compact. In order to keep any external truss portions in isolated regions of the coil, and in order to maintain the dimensions of the coil within those required as set forth above, the product can be manufactured with sequential segments of the coil having alternatingly clockwise and counter clockwise helically progressive configurations as shown in Figure 3D.

Where the product 12 in its non-deployed state as shown to the left in Figure 3D, as the product is drawn from a right end of the coil in the direction of arrow 93, a reference point 96 corresponding to the attachment of the upright truss 72 at an upper portion of the coil and represents the point of maximum rotation during deployment of a first segment 99. To compensate, the upright truss is attached at eleven o'clock and rotates clockwise through an angle of precession 102 shown in Figure 3C to a twelve o'clock position during deployment. Subsequent upright trusses are counter-rotated less, generally along line 105 in the non-deployed configuration until the point 108 corresponding to the attachment of the last of the upright trusses of the first segment 99. A rightmost reference point of maximum rotation on the next segment 111 will rotate counterclockwise back to approximately eleven o'clock. With additional segments, the same alternating precession occurs for a net of zero precession as indicated by the line 114 having upright trusses disposed generally thereon as shown in the



deployed section of product 12 to the right of arrow 93 in Figure 3D. In this way, the compactness of the product in its non-deployed state may be maintained.

In order to form the coils in clockwise and counterclockwise directions, a table of the bender 90 may be shifted right or left in the bender portion of a system for forming the product 12. The segments are connected to each other in regions 117 and 119. In particular, ends of each segment may be attached to each other in a non-continuous configuration as shown at 120 and 123 in regions 117 and 119. In this way, the segments alternate between clockwise and counterclockwise progressions of the product strands 87.

Some of the trusses 72 may have platforms 126 on upper ends thereof as shown in Figures 1B and 3A. Alternatively, stronger uprights 129 may be substituted for some of the upright trusses for the purpose of better supporting the platforms 126 and any components that may be supported thereon, such as lights 132 and/or motion sensors 135 for example. Other components may be mounted thereon, including but not limited to, cameras, transmitters, receivers, and markers. These platforms may be approximately six inches by six inches square to provide a sufficient area to mount electronics or other devices.

Figures 1A, 1B, and 3A also show additional trusses. Some of the additional trusses are lateral trusses 138 that are mainly internal trusses that will experience mostly compression forces similar to the upright trusses 72 and 129. These lateral trusses 138 are connected at internal ends to the upright trusses 72 and 129, and may extend downwardly and outwardly to a position exterior of the product coil. External tips 141 may be bend downward to engage the ground in a cleat like manner. The lateral trusses 138 extend to both opposite lateral sides to a position that provides a relatively large base for the product 12. In this way, the product 12 will be stable in a deployed configuration, even when shaped to be tall and narrow. The lateral trusses 138 may be formed of a flat stock or any other suitable material that may be welded or otherwise fixed to the upright trusses 72 and 129.

Others of the additional trusses shown in Figures 1A, 1B, and 3A include spurs 144. The spurs 144 may be external trusses that are formed of portions of product that are connected at a first connection to a strand of the coil, doubled over the external tips 141 of the lateral trusses 138, and connected to the strand on an opposite side of the first connection.

5 This arrangement advantageously strengthens and stabilizes the lateral trusses 138. Furthermore, when a barbed tape product is used, the spurs 144 act as a deterrent to those that may attempted to breach or disable the barrier by manipulation thereof via grasping or engaging the tips 141. These spurs form external trusses that may be in tension or compression depending upon the forces applied to them. Under normal circumstances at least a lower  
10 extent of a spur 144 will be in tension while the lateral truss 138 that engages the spur 144 will be in compression.

As shown in Figure 4, the product 12 may be fixed to the ground and the trailer 15 may be pulled in a direction of arrow 75. The deployment capability of the present invention permits the erection of a barrier that can form the perimeter of a military compound, for example, in a  
15 very short period of time. A two hundred meter length of product 12 may be deployed from a single magazine 18 in approximately two minutes. This equates to the capability of deploying approximately one quarter mile of product in about four minutes. About one minute is needed to interconnect one coil of product 12 to another coil when one magazine has been emptied and another is to be connected for continued deployment of a barrier. Other products and other  
20 diameter coils may be used in conjunction with the deployment system of the present invention. As the height to width ratio of the product increases, the barrier becomes more like a wall than the traditional round barbed tape products of the past. Additionally, the width of the product may be varied over a length of the product to match a particular landscape or a particular urban environment, which may include wide or narrow streets lined by walls or other structures.

25 Once on site, the product may be deployed in a range from nine hundred to one to one thousand to one man hour ratio improvement for deployment of the eighty by sixty-four inch

product. This is due to improved speed in deployment and the requirement of less men to accomplish the task. An improvement of three hundred to one may be achieved with the deployment system for thirty-eight inch and fifty-two inch diameter products as compared with the time and number of men required to deploy these products without the present system. This improvement is due to increased speed of deployment with the vehicle pulling approach, and to the reduced manpower requirement. The products of the present invention may be deployed by a single person. Two men may be used for a measure of improved security through redundancy. Retrieval may be accomplished by backing up the trailer 15. Normally the gooseneck member 54 will be removed during retrieval of the product, and manual placement of the product coil on the magazine may required so that retrieval of the product is more labor intensive than deployment. However, retrieval with the present system is still faster and easier than without. Automatic retrieval may be implemented by a device that has spring loaded fingers that move along a conveyor path, for example.

While the majority of this description has been directed to the eighty by sixty-four inch concertina product, it is to be understood that a large variety of other configurations of concertina product may be implemented with the present system. Figures 5A-5H have configurations including a variety of upright trusses, lateral trusses, spurs, and blisters. Some of the configurations do not have lateral trusses or provide them in an alternative form from what has been described with regard to Figures 1A, 1B, and 3A above. The variety of trusses shown in Figures 5A-5H may be in compression or tension, and may be provided by strands of product, tubular members, flat stock, or other structural members.

Figures 6A-6P also have a variety of additional configurations. Once again, these configurations implement a variety of trusses that may be in tension and/or compression. Most of the configurations of Figures 6A-6P include a round coiled material similar to those shown and described above. On the other hand, the rounded coils may be shaped by the placement and relative dimensions of the trusses and product coils. For example, Figure 6G shows a

product configuration in which a coil may have been urged into a generally triangular section. Figure 6H shows a product that was not formed of a coil at all. Figure 6I shows a configuration that may include one or more of a connected spacer cable, sensor cable, and communications cable, as indicated by the small circles along the periphery of the coil. It is to be understood that such cable may be secured on an interior or an exterior of the product coil. Figure 6P is a diagrammatic view showing the same configuration as that implemented for the eighty by sixty-four inch product described above. It is to be understood that these configurations may be implemented with any size coils, trusses, and/or other products.

Figures 7A-7G include a variety of configurations having intersecting coils. As shown, the intersecting portions form what appear to be petals of flowers. These petal shaped regions advantageously form integral trusses by virtue of stiffening the respective configurations along the intersections. The configuration of Figure 7B may include a lateral truss as indicated by the horizontal dashed line shown therein. The configuration of Figure 7E is similar to that of Figure 7B, but may have a larger upper coil to provide a taller product of more uniform thickness throughout its height. The configuration of Figure 7F is an example of how the overlap may be extended to a multiple overlap configuration. This advantageous configuration may be extended to any number of overlapping or intersecting coils. Figure 7G depicts a single coil configuration that may be implemented as a simple concertina product. In this regard, it is to be understood that any of the teachings of the present invention may be combined with an otherwise simple concertina product coil to provide the respective advantages. For example, counter rotating segments of a simple concertina to reduce precession could be implemented with any and all of the configurations shown and described herein. On the other hand, counter rotating may not be needed with plural overlapping product coils since the help to reduce or inhibit precession. It is to be understood that any of a variety of trusses and blisters may be attached to the product including blisters or spurs that are positioned within the roll of product until deployment, at which time they extend outside the envelope of the product. Such blisters or spurs may deploy in an umbrella like action. Further alternatively, a three dimensional blister of spur may be

formed by intersecting two or more short strands of product and attaching them to one or more loops of the product.

One of the advantages of an upright truss is shown and described with regard to Figures 8A and 8B. In particular, Figure 8A shows sectional views of deployed products with four respective widths as indicated at 147, even though the heights and the original widths were the same. The progressively reduced width of examples 1-4 is due to elongation of the product in a z-axis direction into the page. As stated above, with the height held constant, the width of the product will decrease with increased deployment length. Alternatively expressed, the harder the product is pulled during deployment, the narrower its deployed width will be. Table 150 shows corresponding widths to lengths of deployment. For example, a product like the eighty by sixty-four inch product described above may reach a length of six hundred and fifty feet when stretched until its original sixty-four inch width shrinks to sixty inches. Similarly, the product could be stretched to nine hundred feet, which would yield a twenty inch width. As a practical matter, the product could be stretched to its maximum physical capacities and reach it narrowest possible width and yield a thousand foot length. In this case the width would not actually be zero as indicated in the table 150. However, it would be the practical minimum. On the other hand, the theoretical maximum length would be approximately one thousand four hundred for a completely planar barrier with no width.

With regard to narrowing a concertina product by stretching, it is to be understood that this and other methods of shaping the configurations of products of the present invention may be implemented. For example, the methods of shaping of copending U.S. patent application serial No. \_\_\_\_/\_\_\_\_ incorporated by reference, including bending the product around turns, may be implemented with the present invention. In fact, it is to be understood that the product in accordance with the present invention could be deployed quickly with varying predetermined widths, heights, and bends to match a contour on which it is to rest in a deployed state, as depicted by the bending and curving product of Figure 9. It is to be understood that the coil of

material may be trussed for elongation in any direction. For example a wide flat coil may be achieved by a generally horizontal truss that is longer than the natural diameter of the coil. The configuration of the product may be changed along its length, and the shaping may be applied to different products of different sizes.

5           In some applications, the tow vehicle 24 and the trailer 15 may not fit between obstacles such as buildings, trees, rocks, or other objects. In such cases, an alternative magazine may be implemented. This magazine may be a hand cart 153 similar to that shown in Figure 9. The hand cart may have a base 156, an upright member 159 that may be height adjustable by selective insertion of shims 162, 165, and 168. A first end of a cantilever support member 171 may be connected to an upper portion of the upright member 159. The cantilever support member 171 may extend in overlying relation towards a second end of the base 156. A gooseneck member 174 may be attached at its first end by a pair of pins 175 and 176 to a second end of the cantilever members, analogously to the gooseneck member 54 described above. However, the hand cart 153 may have a hand grip portion 178 mounted to the upright member as shown in Figure 10.

Figure 10 shows additional features that may or may not be implemented similarly on the magazine of Figures 1A-3A. For example, wheels 180, 183 may be provided to facilitate movement of the cart and a product to be carried thereon. The hand cart 153 may be configured for different sizes of product coils. In particular, the hand cart 153 may be capable of supporting thirty-eight inch and fifty-two inch diameter coils on the cantilever support 171 and the base 156. Additional features may further include a skid 186, which may be additionally or alternatively provided with or without the wheels 180, 183. This skid may be selectively deployable such as for environmental conditions that require it. For example, in deep loose sand, in snow, or mud, the skid 186 may prove beneficial. Another feature is a floatation mechanism 189, which may be permanently or selectively available. For example, the floatation mechanism 189 may simply be provided as a light weight buoyant material of

relatively constant volume. Alternatively or additionally, the floatation mechanism may be provided as an inflatable enclosure. The floatation mechanism may thus advantageously provide buoyancy to the cart and any product supported thereon in swamps or when fording a stream, for example.

5           Another feature that may be applied to the hand cart 153 or the magazine 18, is an adjustable eccentric member 192 supported on the gooseneck. This eccentric member 192 may be rotated so that it provides a continuous guide of greater or lesser height for the loops of the concertina product being deployed. In this way, a greater or lesser restriction to passage of the loops off of the cantilevered supports 51, 171 and over the gooseneck members 54, 174 is  
10           provided. The result is that the spacing between adjacent loops of the product may be adjusted by raising or lowering the eccentric member 192. In a raised position, the resistance to passage of the product over the gooseneck 54, 174 will be increased. Therefore, the product will be stretched to a greater degree. For the products incorporating upright trusses, this results in narrower with barriers in the deployed state.

15           Thus, the product may be provided in any of a variety of shaped configurations within a roll or from roll to roll both by varying the clipping sequence as disclosed in the copending U.S. Application Serial No. \_\_/\_\_\_\_, entitled SYSTEM AND METHODS FOR FORMING BARBED TAPE CONCERTINA PRODUCT, by the same inventor, filed October 5, 2004, which is incorporated herein by reference. Additionally or alternatively, the product may be  
20           shaped by placement of the internal and external trusses described herein. Furthermore, the width of the product may be increased while a height is decreased by placement of a generally horizontal truss in the product. The resulting configuration that may be achieved by a predetermined pattern of trussing and/or clipping may be expressed a dynamic shaping action of the barrier during deployment along a Z-Axis that shapes the envelope in X-Y-directions.

The products herein described may be advantageously benefitted by the particulars of the clips used in attaching the product to itself and to trusses. The particulars of copending U.S. Serial No. \_\_/\_\_\_\_\_, entitled BARBED TAPE PRODUCT WITH A PREDETERMINED PATTERN OF ATTACHMENT POINTS AND ATTACHMENT ELEMENT, by the same  
5 inventor, filed October 5, 2004, which is incorporated herein by reference are pertinent. These clips have the advantage of a firm and more rigid attachment that is more stable and results in less misclipping, especially in an automatic clipping operation.

The embodiments and examples set forth herein were presented in order to best explain the present invention and its practical application and to thereby enable those of ordinary skill in  
10 the art to make and use the invention. However, those of ordinary skill in the art will recognize that the foregoing description and examples have been presented for the purposes of illustration and example only. The description as set forth is not intended to be exhaustive or to limit the invention to the precise form disclosed. Many modifications and variations are possible in light of the teachings above without departing from the spirit and scope of the forthcoming claims.



## CLAIMS

- 1     1.     A tape product comprising:  
2             a concertina coil;  
3             at least one of an internal truss and external truss connected to the coil at a plurality of  
4     connection points;  
5             wherein the truss strengthens or stabilizes the coil.
- 6     2.     The tape product of claim 1, wherein the concertina coil is a first concertina coil  
7     and the truss is an integral portion of at least one additional concertina coil that intersects with  
8     and is connected to the first concertina coil.
- 9     3.     The tape product of claim 1, wherein:  
10            the truss comprises a compression member connected at the connection points to  
11     portions of the coil; and  
12            the truss holds the portions away from each other at a predetermined distance.
- 13    4.     The tape product of claim 3, wherein the connection points define a chord of the  
14    coil.
- 15    5.     The tape product of claim 4, wherein:  
16            the truss includes a upright truss connected to the diametrically opposite portions of the  
17    coil; and  
18            at least one additional truss is connected to an additional portion of the coil at one or  
19    more of additional connection points.
- 20    6.     The tape product of claim 1, wherein the trusses comprise at least one tension  
21    member connected to the coil at one or more of the connection points.

- 1    7.     The tape product of claim 1, wherein:  
2           the coil is a first coil;  
3           the tape product further comprises a second coil; and  
4           the truss suspends the second coil within the first coil.
- 5    8.     The tape product of claim 1, wherein the truss comprises an external truss that  
6           forms a blister or spur extending radially outside an envelope of the coil.
- 7    9.     The tape product of claim 8, wherein:  
8           the truss is a first truss;  
9           the tape product comprises a plurality of trusses including the first truss; and  
10          the plurality of trusses comprises at least one tension member and at least one  
11          compression member.
- 12   10.    The tape product of claim 9, wherein the tension member and the compression  
13          member are interconnected to provide the spur.
- 14   11.    The tape product of claim 9, wherein the plurality of trusses comprise a plurality  
15          of upright compression members and a plurality of spurs.
- 16   12.    The tape product of claim 11, further comprising an accessory platform mounted  
17          on an end of at least one of the upright compression members.

1 13. The tape product of claim 8, wherein:  
2 the truss is a first truss;  
3 the tape product includes a plurality of trusses including the first truss; and  
4 the plurality of trusses form at least one blister on the coil.

14. A plural coil tape product comprising:  
a first concertina coil extending from a first end to a second end of the coil along a first coil axis;  
at least a second concertina coil extending generally from a first end to a second end of the coil along a second coil axis; and  
the second concertina coil intersecting the first concertina coil in at least partially overlapping side by side relation in a first intersection along the first and second coil axes;  
wherein the first intersection comprises connection of the second concertina coil at more than one circumferentially spaced connection point on the first coil.

15. The plural coil tape product of claim 14, further comprising:  
at least a third concertina coil extending generally from a first end to a second end of the third coil along a third coil axis;  
the third coil intersecting at least one of the first and second coils in at least partially overlapping side by side relation in a second intersection along the first, second, and third axes;  
wherein the second intersection comprises connection of the third concertina coil at more than one circumferentially spaced connection points on at least one of the first and second coils.

16. The plural coil tape product of claim 15, wherein the third coil intersects both of the first and second coils in overlapping side by side relation so that the first, second, and third coil axes generally define vertices of a triangular configuration of the coil tape product.

17. The plural coil tape product of claim 16, wherein each of the first, second, and third coils intersects each of the other coils in at least two connection points.

18. The plural coil tape product of claim 15, wherein at least one of the connection points is also an attachment point for attaching adjacent loops of a coil in a concertina configuration.

19. The plural coil tape product of claim 15, further comprising one or more trusses attached to at least one of the first, second, and third coils.

20. A deployment system for deploying and retrieving a concertina tape product, the system comprising:

- a product magazine having at least one base, a stanchion supported on the base, and a latch mounted on the stanchion;

- the stanchion having an upright member extending upwardly from a first end of the base and a cantilever support member with a first end connected to the upright member and a second end extending in overlying relation to the base toward a second end of the base;

- the cantilever support member having a connection structure at the second end of the cantilever support member for selectively receiving a gooseneck member; and

- the gooseneck member removeably connected at a first end of the gooseneck member to the connection structure in one of at least two configurations.

21. The deployment system of claim 20, wherein the at least two configurations comprise:

- a first deployment configuration in which the gooseneck member extends generally longitudinally aligned with a length of the cantilever support member; and

- a second securing configuration in which the gooseneck member extends generally longitudinally transverse to the length of the cantilever support member.

22. The deployment system of claim 21, wherein:  
the base has a locking structure on a second end of the base; and  
the gooseneck has a mating locking structure on a second end of the gooseneck member releaseably lockable with the locking structure on the base.
23. The deployment system of claim 20, wherein the latch selectively secures the magazine to a vehicle.
24. The deployment system of claim 23, wherein the vehicle comprises a trailer with a height adjustable load support structure.
25. The deployment system of claim 20, wherein the base has rollers on an underside for rolling engagement with a ground surface.
26. The deployment system of claim 20, wherein the upright member is a height adjustable upright member.
27. The deployment system of claim 20, wherein the gooseneck member comprises a bend such that when the gooseneck member is attached to the cantilever support member in a first deployment configuration, the bend extends upwardly relative to the cantilever support member.
28. The deployment system of claim 27, wherein the gooseneck member further comprises an eccentric adjustably mounted at the bend to adjustably extend the bend upwardly relative to the cantilever support.
29. A shaped concertina tape product comprising:  
a concertina coil forming an envelope of a predetermined configuration;

a plurality of trusses connected to the coil;

wherein the coil is rigidified against forces in one or more direction so that in a deployed state, an original dimension of the envelope in a rigidified direction is maintained while a dimension in a non-rigidified direction is reduced.

30. The shaped concertina tape product of claim 29, wherein the envelope has an elliptical section in the deployed state.

31. The shaped concertina tape product of claim 29, wherein the envelope has a generally ogive section in the deployed state.

32. The shaped concertina tape product of claim 31, wherein the trusses comprise upright trusses and the rigidified direction is in a generally vertical direction.

33. The shaped concertina tape product of claim 32, wherein a vertical dimension of the coil is approximately eighty inches in both the deployed state and the retracted state and a horizontal dimension is approximately sixty-four inches in the deployed state.

34. The shaped concertina tape product of claim 29, wherein the configuration of the envelope has a variety of preselected sectional dimensions along a length of the coil.

35. The shaped concertina tape product of claim 29, wherein:

the concertina coil is formed by a plurality concertina coil segments having respective helically progressive strands each having an end connected to an end of an adjacent one of the plurality of concertina coil segments;

wherein the strand of each adjacent segment progresses helically in an opposite rotational direction relative to the adjacent coil segment.

36. The shaped concertina tape product of claim 35, wherein the plurality of segments alternately comprise respective clockwise and counterclockwise helically progressive strands connected end to end.

\* \* \* \*

# **CONCERTINA TAPE PRODUCTS CONFIGURED FOR STABLE DEPLOYMENT AND RETRIEVAL**

## **ABSTRACT OF THE DISCLOSURE**

A deployment system and associated products utilize a magazine for holding and dispensing the products. The products may have any of a number of internal and external trusses that may be in tension and/or compression for rigidifying the product in selected directions. Thus the product may be shaped to fit a predetermined contour. The magazine may be supported on a deployment vehicle for ease of deployment of the product.



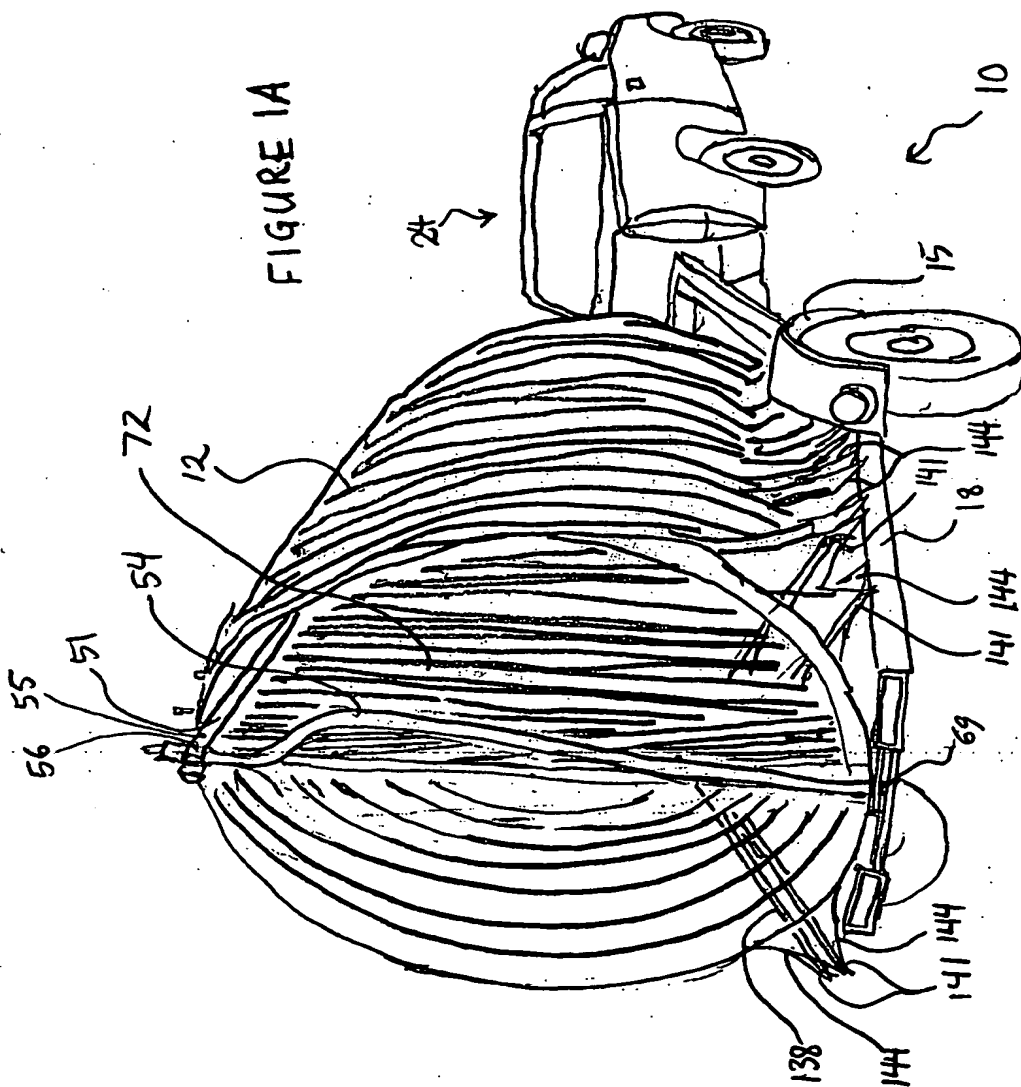


FIGURE 1A

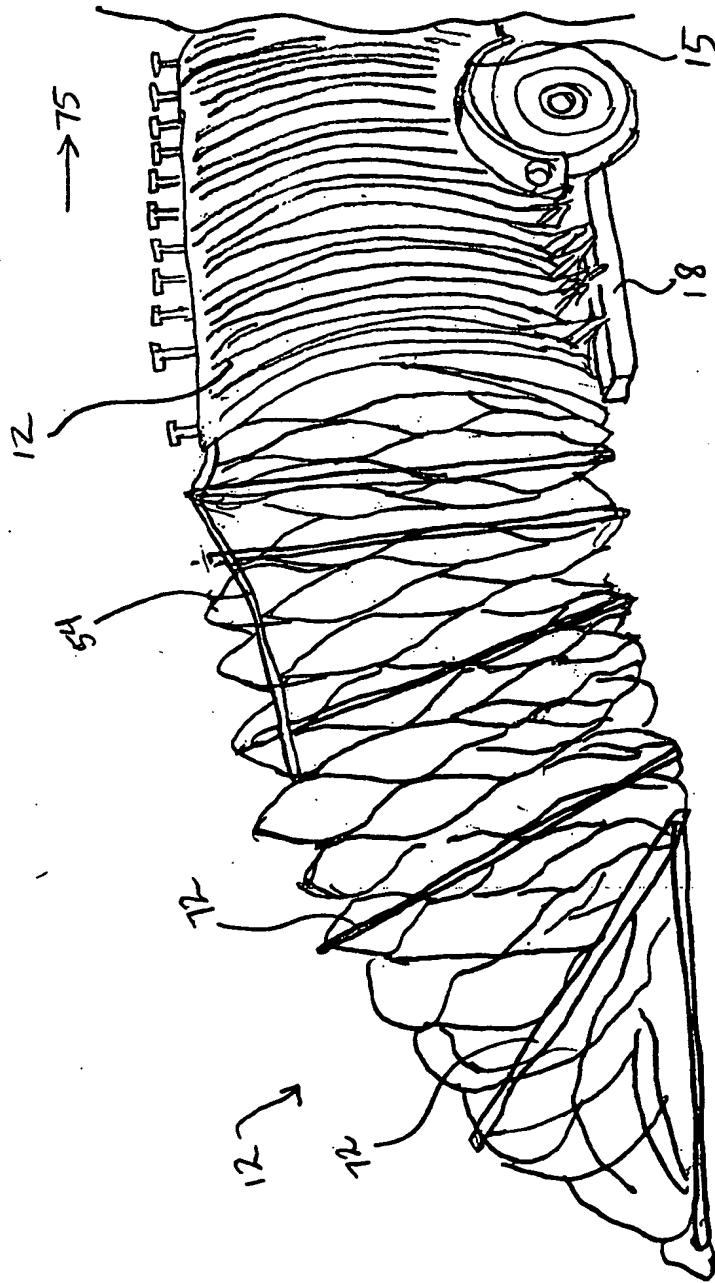


FIGURE 4

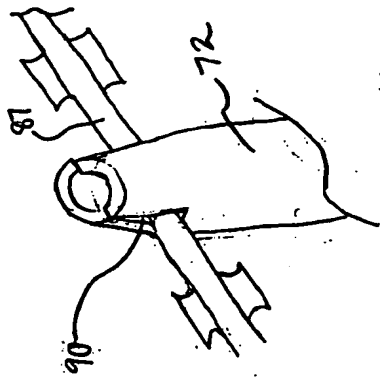


FIGURE 3B

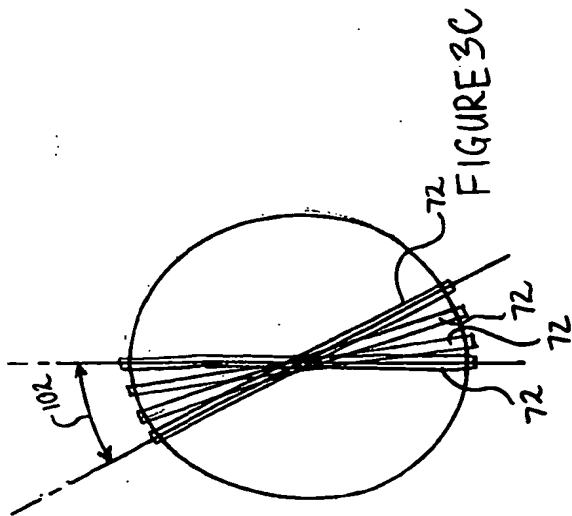


FIGURE 3C

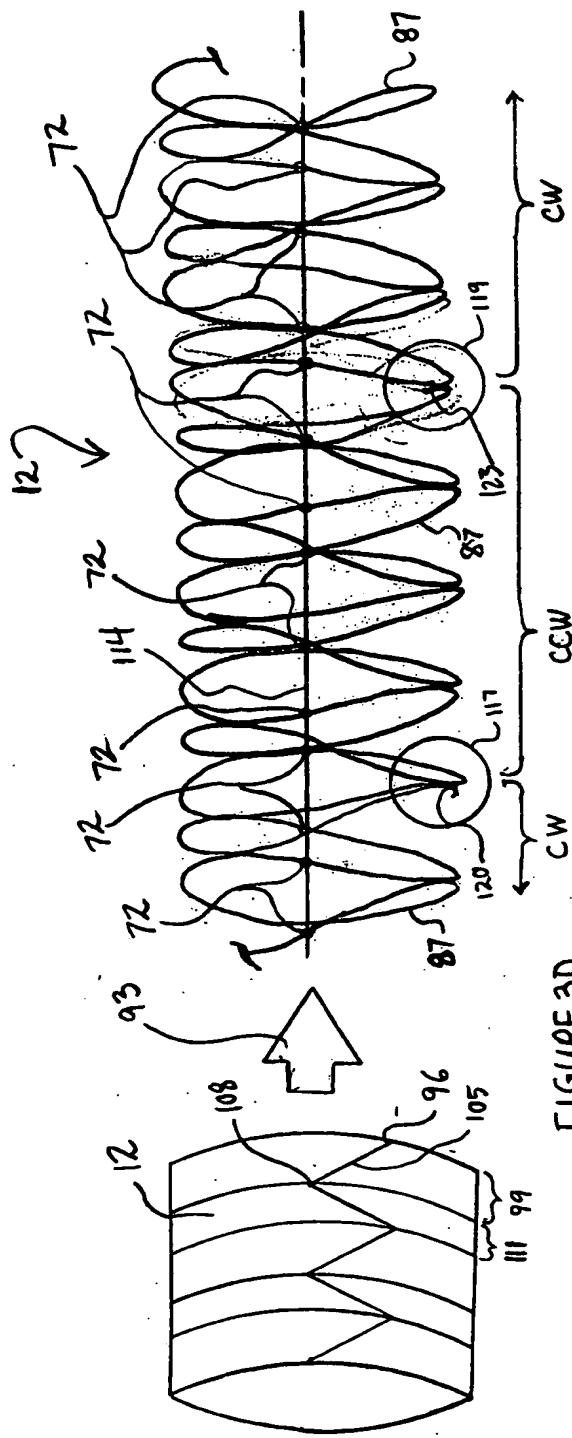
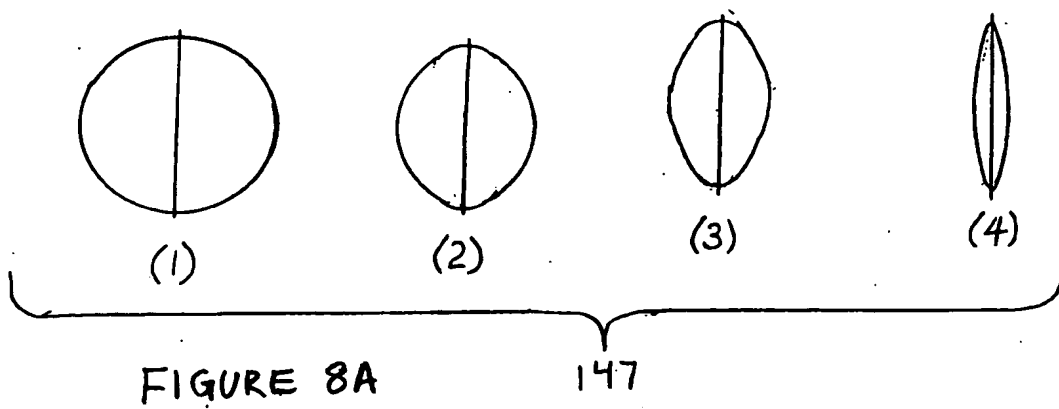


FIGURE 3D



150

	WIDTH(IN)	LENGTH (FT)
1	74	0
2	60	650
3	20	900
4	0	1,000

FIGURE 8B

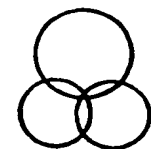


FIGURE 7E

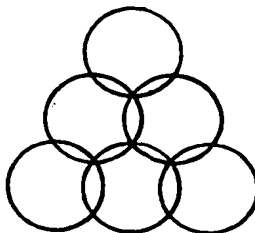


FIGURE 7F

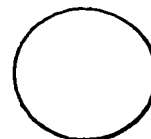


FIGURE 7G

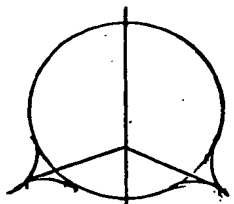
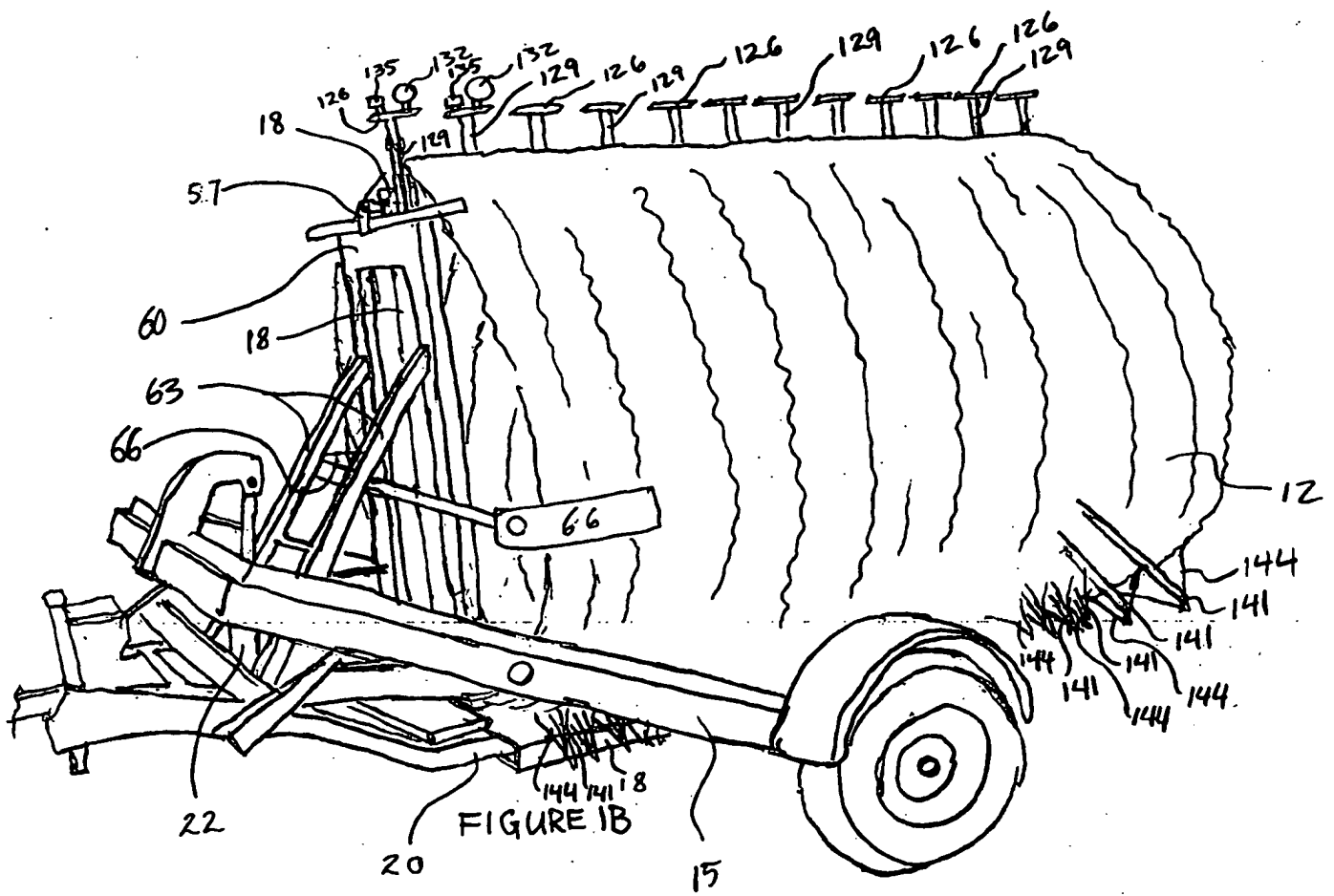


FIGURE 5A

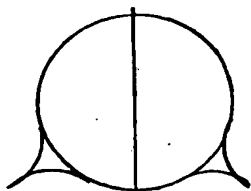


FIGURE 5B

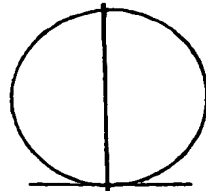


FIGURE 5C

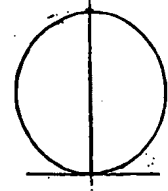


FIGURE 5D

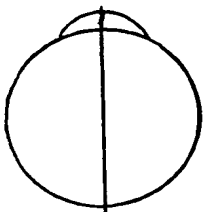


FIGURE 5E

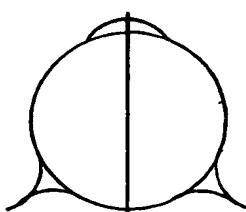


FIGURE 5F

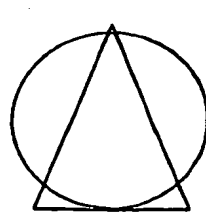


FIGURE 5G

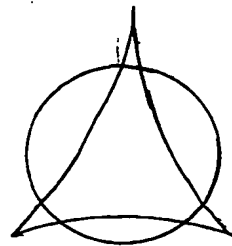


FIGURE 5H

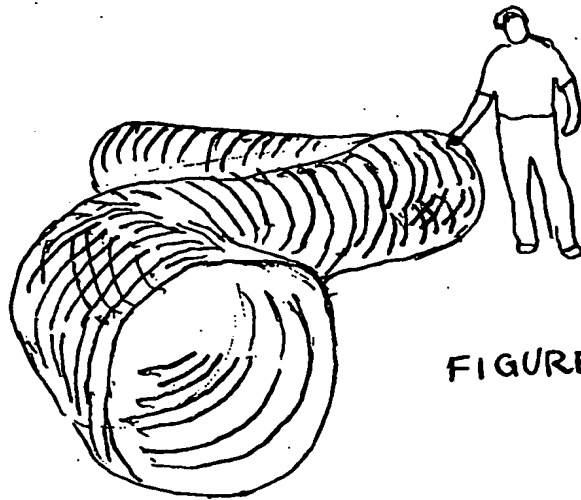
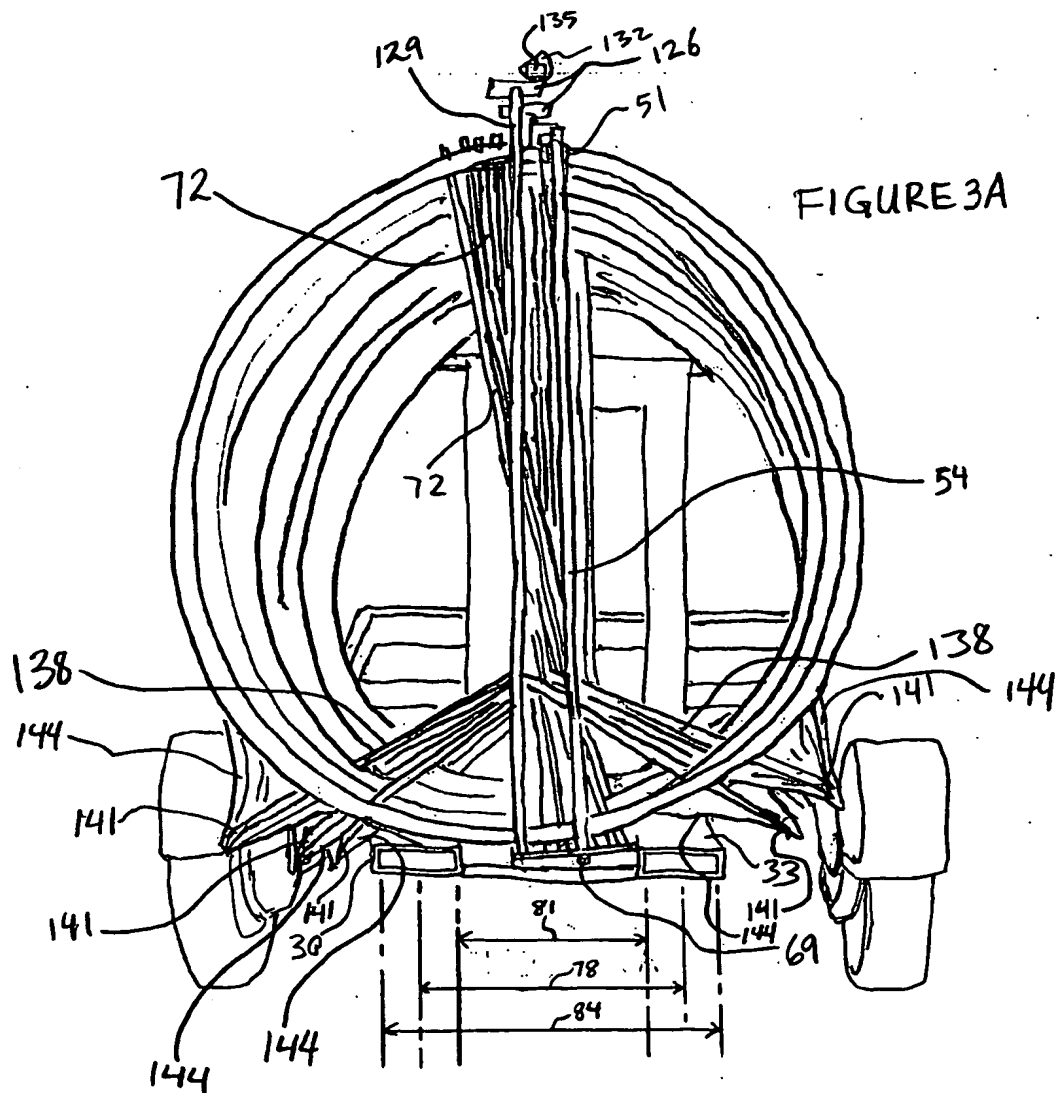


FIGURE 9



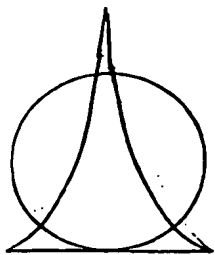


FIGURE 6A

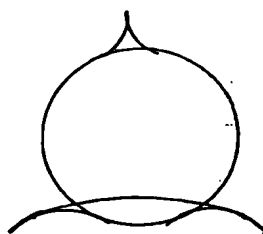


FIGURE 6B

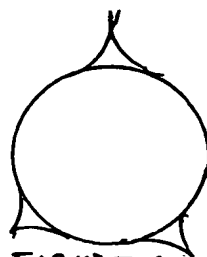


FIGURE 6C

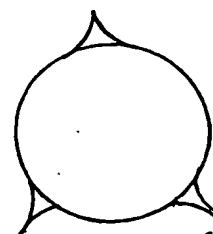


FIGURE 6D

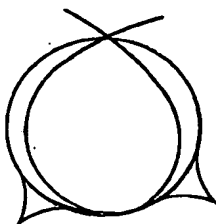


FIGURE 6E

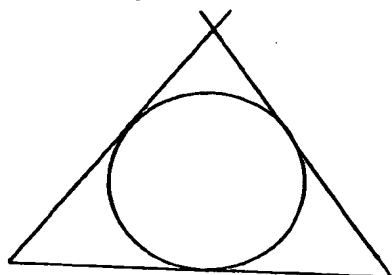


FIGURE 6F

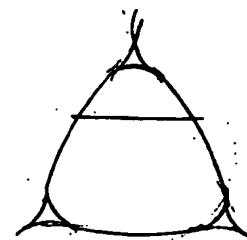


FIGURE 6G

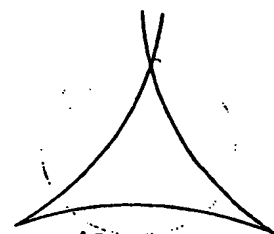


FIGURE 6H

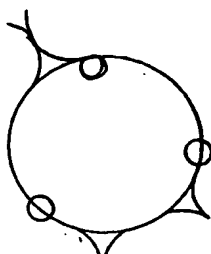


FIGURE 6I

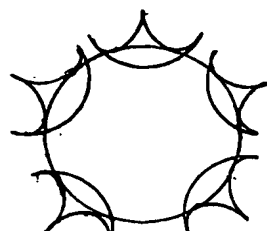


FIGURE 6J

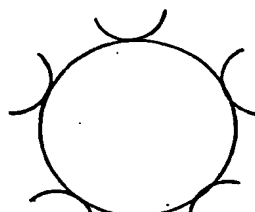


FIGURE 6K

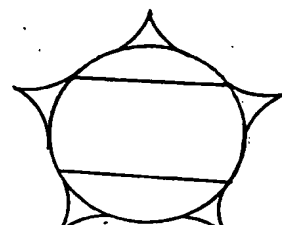


FIGURE 6L

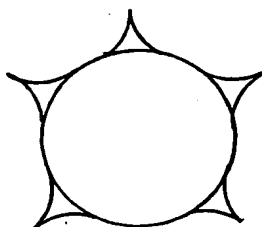


FIGURE 6M

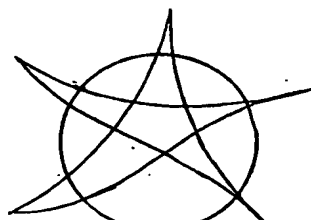


FIGURE 6N



FIGURE 6O



FIGURE 7A

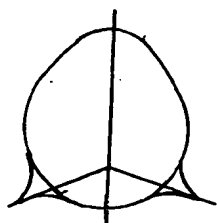


FIGURE 6P

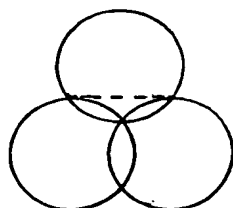


FIGURE 7B

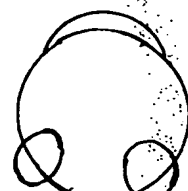


FIGURE 7C

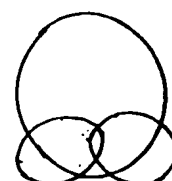


FIGURE 7D

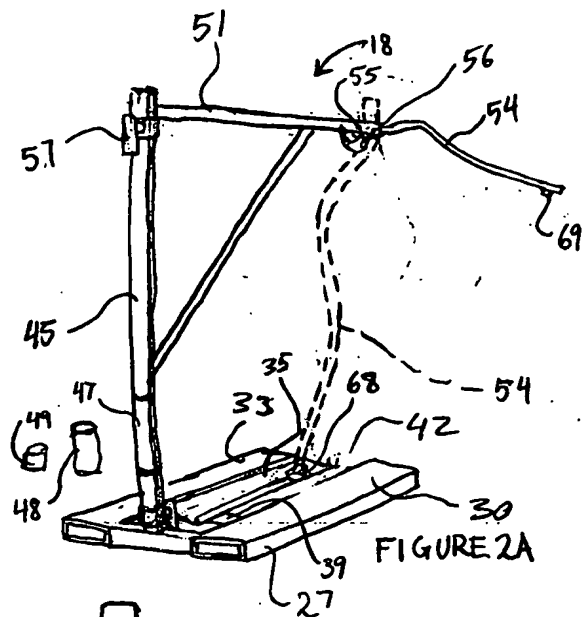


FIGURE 2A

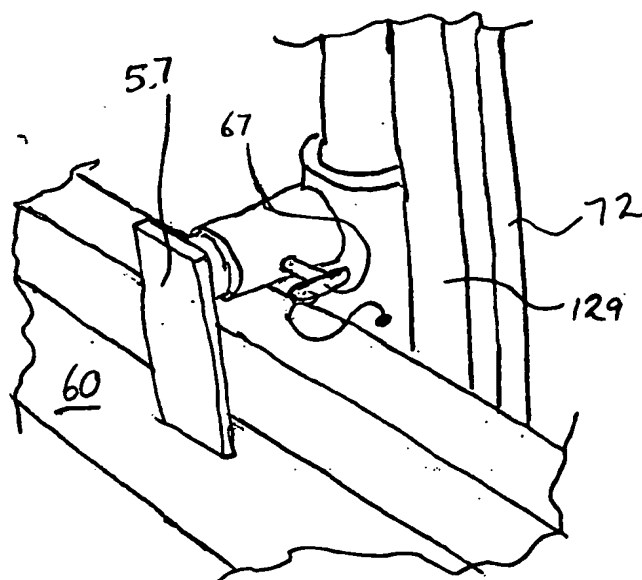


FIGURE 2B

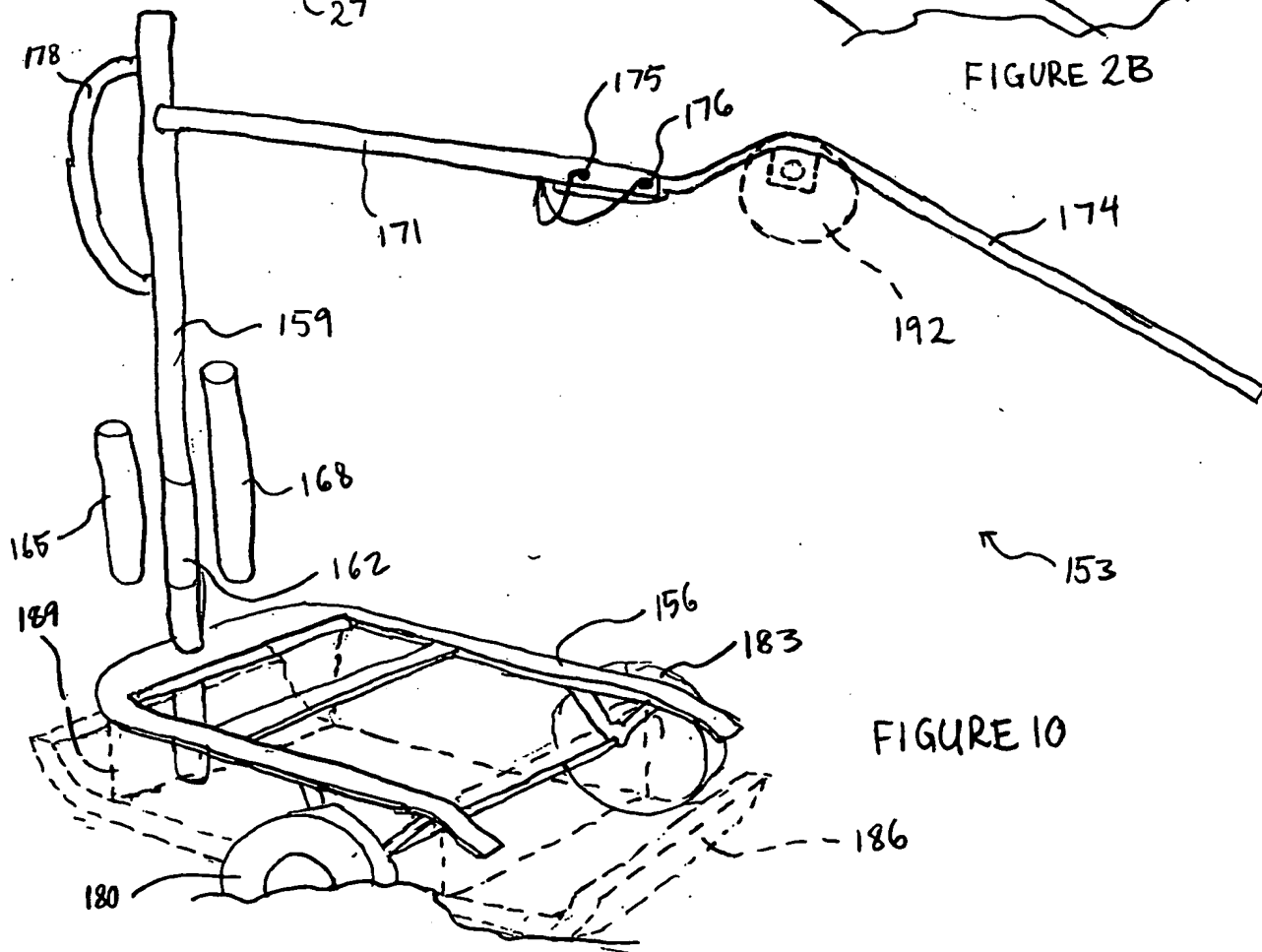


FIGURE 10



## DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

**Attorney Docket  
No.: COBR-10493**

As a below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled: **CONCERTINA TAPE PRODUCTS CONFIGURED FOR STABLE DEPLOYMENT AND RETRIEVAL**, the specification of which

(check one)   X   is attached hereto.  
       was filed on \_\_\_\_\_ as Application Serial No. \_\_\_\_\_ and was amended on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above and the drawings to which it refers.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations Sec. 1.56(a).

I hereby claim the benefit under Title 35, United States Code Sec. 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States code, Sec. 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Sec. 1.56(a) which occurred between the filing date of the prior application and the national or PCT International filing date of this application:

_____	_____	_____
Application Serial No.	Filing Date	Status
_____	_____	_____
Application Serial No.	Filing Date	Status

## POWER OF ATTORNEY

Applicant hereby appoints Albert L. Schmeiser, Registration No. 30,681; Arlen L. Olsen, Registration No. 37, 543; Charles T. Watts, Registration No. 16,564; Jack P. Friedman, Registration No. 44,688; Kenneth C. Booth, Registration No. 42,342; Diane E. Smith, Registration No. 40,180; Pacer K. Udall, Registration No. 50,976; Tallie J. Anderson, Utah Bar No. 09957; and David E. Allred, Registration No. 47,254 of Schmeiser, Olsen & Watts LLP, 18 East University Drive, #101, Mesa, Arizona, 85201, (480) 655-0073, to prosecute this application to register, to transact all business in this Patent and Trademark Office in connection therewith.

SEND CORRESPONDENCE TO:                      Customer No.: 23123  
David E. Allred  
Schmeiser, Olsen & Watts LLP  
18 East University Drive, #101  
Mesa, Arizona 85201

DIRECT TELEPHONE CALLS TO:                  David E. Allred  
480-655-0073

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

NAME OF INVENTOR:   Michael V. Pavlov

SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

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From the INTERNATIONAL BUREAU

**PCT**NOTIFICATION CONCERNING  
SUBMISSION OR TRANSMITTAL  
OF PRIORITY DOCUMENT

To:

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(PCT Administrative Instructions, Section 411)

Date of mailing (day/month/year) 26 October 2005 (26.10.2005)	
Applicant's or agent's file reference COBR-10811	IMPORTANT NOTIFICATION
International application No. PCT/US2005/025658	International filing date (day/month/year) 19 July 2005 (19.07.2005)
International publication date (day/month/year)	Priority date (day/month/year) 19 July 2004 (19.07.2004)
Applicant COBRA SYSTEMS, INC. et al	

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<u>Priority date</u>	<u>Priority application No.</u>	<u>Country or regional Office or PCT receiving Office</u>	<u>Date of receipt of priority document</u>
05 October 2004 (05.10.2004)	10/959,531	US	12 September 2005 (12.09.2005)

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International application No. <b>PCT/US2005/025658</b>	International filing date (day/month/year) <b>19 July 2005 (19.07.2005)</b>		
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05 October 2004 (05.10.2004)	10/959,944	US	12 September 2005 (12.09.2005)

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05 October 2004 (05.10.2004)	10/959,531	US	12 September 2005 (12.09.2005)
05 October 2004 (05.10.2004)	10/959,944	US	12 September 2005 (12.09.2005)

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